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DATE: Wednesday, December 15, 2004

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DB=PGPB,USPT; PLUR=YES; OP=ADJ

<input type="checkbox"/>	L10	L9 and avp1	4
<input type="checkbox"/>	L9	l5 and (freez\$ or chill\$)	100
<input type="checkbox"/>	L8	l5 and seed production	5
<input type="checkbox"/>	L7	l5 and root	25
<input type="checkbox"/>	L6	L5 and (ppase or vppase)	8
<input type="checkbox"/>	L5	L4 and (proton or H+)	113
<input type="checkbox"/>	L4	L3 and plant	158
<input type="checkbox"/>	L3	L2 and transgenic	168
<input type="checkbox"/>	L2	L1 and (tonoplast or vacuol\$)	237
<input type="checkbox"/>	L1	pyrophosphatase	1599

END OF SEARCH HISTORY

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* * * * * STN Columbus * * * * *

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=> s (ppase or pyrophosphatase) and plant?

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=> file agricola caplus biosis

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SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

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0.42

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=> s (ppase or pyrophosphatase) and plant?
L1 1706 (PPASE OR PYROPHOSPHATASE) AND PLANT?

=> s l1 and tonoplast
L2 409 L1 AND TONOPLAST

=> del l2 y

=> s l1 and (tonoplast or vacuole)
L2 531 L1 AND (TONOPLAST OR VACUOLE)

=> s l2 and transgenic
L3 12 L2 AND TRANSGENIC

=> dup rem l3
PROCESSING COMPLETED FOR L3
L4 7 DUP REM L3 (5 DUPLICATES REMOVED)

=> d 1-7 ti

L4 ANSWER 1 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN
TI Enhanced meristematic activity and competence by overexpression of
tonoplast pyrophosphatase

L4 ANSWER 2 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN
TI Stress-resistant oversized **transgenic plants** capable
of growing in salinized soil

L4 ANSWER 3 OF 7 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 1
TI Drought- and salt-tolerant **plants** result from overexpression of
the AVP1 H⁺-pump.

L4 ANSWER 4 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN
TI Production of male sterile **plant** by using pollen-specific
promoter

L4 ANSWER 5 OF 7 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
TI Identification and characterization of a novel vacuolar compartment in
Nicotiana tabacum.

L4 ANSWER 6 OF 7 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
TI The role of sugar accumulation in leaf frost hardiness - investigations
with **transgenic** tobacco expressing a bacterial
pyrophosphatase or a yeast invertase gene

L4 ANSWER 7 OF 7 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 3
TI Light-stimulated proton transport into the vacuoles of leaf mesophyll
cells does not require energization by the **tonoplast**
pyrophosphatase.

=> s avp1

L5 42 AVP1

=> s 15 and pyrophosphatase

L6 22 L5 AND PYROPHOSPHATASE

=> dup rem 16

PROCESSING COMPLETED FOR L6

L7 14 DUP REM L6 (8 DUPLICATES REMOVED)

=> d 1-10 ti

L7 ANSWER 1 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
STN

TI VOZ; Isolation and characterization of novel vascular plant transcription
factors with a one-zinc finger from Arabidopsis thaliana.

L7 ANSWER 2 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1

TI Isolation and Characterization of TgVP1, a Type I Vacuolar
H⁺-translocating **Pyrophosphatase** from Toxoplasma gondii. The
dynamics of subcellular localization and the cellular effects of a
diphosphonate inhibitor

L7 ANSWER 3 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN

TI Arabidopsis CAMTA family proteins enhance V-PPase expression in pollen

L7 ANSWER 4 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN

TI Use of Arabidopsis thaliana tps1 gene encoding trehalose-6-phosphate
synthase as selection markers for transgenic plants with improved stress
resistance

L7 ANSWER 5 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN

TI Enhanced meristematic activity and competence by overexpression of
tonoplast **pyrophosphatase**

L7 ANSWER 6 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN

TI Functional complementation of yeast cytosolic **pyrophosphatase** by
bacterial and plant H⁺-translocating pyrophosphatases

L7 ANSWER 7 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
STN

TI Over-expression of the vacuolar H⁺-pump **AVP1** positively affects
growth and development in Arabidopsis.

L7 ANSWER 8 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN

TI Stress-resistant oversized transgenic plants capable of growing in
salinized soil

L7 ANSWER 9 OF 14 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 2

TI Drought- and salt-tolerant plants result from overexpression of the
AVP1 H⁺-pump.

L7 ANSWER 10 OF 14 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 3

TI Pollen-specific regulation of vacuolar H⁺-PPase expression by multiple
cis-acting elements.

=> d 7 ab

L7 ANSWER 7 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
STN

=> d 7 so

L7 ANSWER 7 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
STN
SO Plant Biology (Rockville), (2002) Vol. 2002, pp. 95-96. print.
Meeting Info.: Annual Meeting of the American Society of Plant Biologists
on Plant Biology. Denver, CO, USA. August 03-07, 2002. American Society of
Plant Biologists.

=> d 8 ab

L7 ANSWER 8 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN
AB A stress resistant, oversized, transgenic plant capable of growing in
salinized media comprising a polynucleotide sequence causing upregulated
express of vacuolar **pyrophosphatase**. Further disclosed, is the
seed produced by such transgenic plants which comprises such
polynucleotide sequence, and progeny plants grown from such seed. Thus,
tomato plants, transformed with the genes AVP-1 which encodes for an
inorg. **pyrophosphatase** and NHX-1 which encodes for a sodium
transporter, demonstrated higher intracellular cation concns. when grown
in saline soils.

=> d 8 so

L7 ANSWER 8 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN
SO PCT Int. Appl., 68 pp.
CODEN: PIXXD2

=> d 8 pi

L7 ANSWER 8 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001033945	A1	20010517	WO 2000-US30955	20001110
WO 2001033945	C1	20020725		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
CA 2390719	AA	20010517	CA 2000-2390719	20001110
BR 2000015636	A	20020709	BR 2000-15636	20001110
EP 1231831	A1	20020821	EP 2000-980337	20001110
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR			
JP 2003516727	T2	20030520	JP 2001-535966	20001110
NZ 519362	A	20040528	NZ 2000-519362	20001110
CA 2418127	AA	20020228	CA 2001-2418127	20010324
WO 2002015674	A1	20020228	WO 2001-US9548	20010324
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,			

CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

AU 2001050974 A5 20020304 AU 2001-50974 20010324
 EP 1315410 A1 20030604 EP 2001-924311 20010324

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

BR 2001013466 A 20040217 BR 2001-13466 20010324
 US 2002178464 A1 20021128 US 2001-834998 20010413
 US 2002023282 A1 20020221 US 2001-934088 20010820
 CA 2419901 AA 20020228 CA 2001-2419901 20010820
 WO 2002016558 A1 20020228 WO 2001-US41806 20010820

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2001085459 A5 20020304 AU 2001-85459 20010820
 EP 1315795 A1 20030604 EP 2001-964622 20010820

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

BR 2001013467 A 20040406 BR 2001-13467 20010820

=> d 9 ab

- L7 ANSWER 9 OF 14 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 2
- AB Transgenic plants overexpressing the vacuolar H(+)-pyrophosphatase are much more resistant to high concentrations of NaCl and to water deprivation than the isogenic wild-type strains. These transgenic plants accumulate more Na(+) and K(+) in their leaf tissue than the wild type. Moreover, direct measurements on isolated vacuolar membrane vesicles derived from the **AVP1** transgenic plants and from wild type demonstrate that the vesicles from the transgenic plants have enhanced cation uptake. The phenotypes of the **AVP1** transgenic plants suggest that increasing the vacuolar proton gradient results in increased solute accumulation and water retention. Presumably, sequestration of cations in the vacuole reduces their toxic effects. Genetically engineered drought- and salt-tolerant plants could provide an avenue to the reclamation of farmlands lost to agriculture because of salinity and a lack of rainfall.

=> d 9 so

- L7 ANSWER 9 OF 14 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 2
- SO Proceedings of the National Academy of Sciences of the United States of America, Sept 25, 2001. Vol. 98, No. 20. p. 11444-11449
 Publisher: Washington, D.C. : National Academy of Sciences,

=> d 10 ab

- L7 ANSWER 10 OF 14 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 3
- AB We dissected the regulatory region of the **AVP1** gene encoding the vacuolar H⁺-**pyrophosphatase** (V-PPase) of *Arabidopsis thaliana* by using a GUS-reporter assay system. The cloned 1.4 kb 5'-regulatory region in the GUS-reporter transgenic plants was sufficient for the light-induced repression. Furthermore, the 1.4 kb regulatory region was active in all tissues examined and its activity was especially enhanced in pollen, whereas the shorter 0.4 kb regulatory region was active only in pollen. Further detailed analyses revealed that the GUS activity in pollen was regulated by at least three cis-acting regions in an additive or synergetic manner. These findings establish a distinct mechanism of the tissue-specific regulation of V-PPase expression in developing pollen, and imply the biological significance of the V-PPase in pollen maturation.

=> d 11-14 ti

- L7 ANSWER 11 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
- TI Increased size, salt and drought tolerance in *A. thaliana* overexpressing **AVP1** vacuolar H⁺- **pyrophosphatase**.
- L7 ANSWER 12 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
- TI AVP2, a sequence-divergent, K⁺-insensitive H⁺-translocating inorganic **pyrophosphatase** from *Arabidopsis*
- L7 ANSWER 13 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
- TI Gene regulation of vacuolar proton **pyrophosphatase**: Identification of pollen-specific regulatory region.
- L7 ANSWER 14 OF 14 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 5
- TI The *Arabidopsis thaliana* proton transporters, AtNhxl and **Avp1**, can function in cation detoxification in yeast.

=> d 11 ab

- L7 ANSWER 11 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN

=> d 11 so

- L7 ANSWER 11 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
- SO Plant Biology (Rockville), (2001) Vol. 2001, pp. 85. print. Meeting Info.: Joint Annual Meetings of the American Society of Plant Biologists and the Canadian Society of Plant Physiologists. Providence, Rhode Island, USA. July 21-25, 2001. American Society of Plant Biologists; Canadian Society of Plant Physiologists.

=> d 12 ab

L7 ANSWER 12 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
AB Plant vacuolar H⁺-translocating inorg. pyrophosphatases (V-PPases; E.C. 3.6.1.1) have been considered to constitute a family of functionally and structurally monotonous intrinsic membrane proteins. Typified by **AVP1** from Arabidopsis, all characterized plant V-PPases share greater than 84% sequence identity and catalyze K⁺-stimulated H⁺ translocation. Here we describe the mol. and biochem. characterization of AVP2 (accession number AF182813), a sequence-divergent (36% identical) K⁺-insensitive, Ca²⁺-hypersensitive V-PPase active in both inorg. pyrophosphate hydrolysis and H⁺ translocation. The differences between AVP2 and **AVP1** provide the first indication that plant V-PPases from the same organism fall into two distinct categories. Phylogenetic analyses of these and other V-PPase sequences extend this principle by showing that AVP2, rather than being an isoform of **AVP1**, is but one representative of a novel category of AVP2-like (type II) V-PPases that coexist with **AVP1**-like (type I) V-PPases not only in plants, but also in apicomplexan protists such as the malarial parasite Plasmodium falciparum.

=> d 12 so

L7 ANSWER 12 OF 14 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
S0 Plant Physiology (2000), 123(1), 353-362
CODEN: PLPHAY; ISSN: 0032-0889

=> d 13 ab

L7 ANSWER 13 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN

=> d 13 so

L7 ANSWER 13 OF 14 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
S0 Plant Biology (Rockville), (2000) Vol. 2000, pp. 187. print.
Meeting Info.: Annual Meeting of the American Society of Plant Physiologists. San Diego, California, USA. July 15-19, 2000. American Society of Plant Physiologists (ASPP).

=> dis his

(FILE 'HOME' ENTERED AT 09:45:57 ON 15 DEC 2004)

FILE 'AGRICOLA, CAPLUS, BIOSIS' ENTERED AT 09:46:53 ON 15 DEC 2004

L1 1706 S (PPASE OR PYROPHOSPHATASE) AND PLANT?
L2 531 S L1 AND (TONOPLAST OR VACUOLE)
L3 12 S L2 AND TRANSGENIC
L4 7 DUP REM L3 (5 DUPLICATES REMOVED)
L5 42 S AVP1
L6 22 S L5 AND PYROPHOSPHATASE
L7 14 DUP REM L6 (8 DUPLICATES REMOVED)

=> s l2 and (salt or freez? or seed or drought)

L8 102 L2 AND (SALT OR FREEZ? OR SEED OR DROUGHT)

=> s l8 and (toler? or resist?)

L9 50 L8 AND (TOLER? OR RESIST?)

=> dup rem l9
PROCESSING COMPLETED FOR L9
L10 29 DUP REM L9 (21 DUPLICATES REMOVED)

=> d 1-10 ti

- L10 ANSWER 1 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
TI Effect of **salt** and osmotic stresses on the expression of genes for the vacuolar H⁺-**pyrophosphatase**, H⁺-ATPase subunit A, and Na⁺/H⁺ antiporter from barley
- L10 ANSWER 2 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
TI Transport proteins and **salt tolerance** in **plants**
- L10 ANSWER 3 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
TI Study on the **salt** and **drought tolerance** of Suaeda salsa and Kalanchoe clavigremontiana under iso-osmotic **salt** and water stress
- L10 ANSWER 4 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 3
TI Increased vacuolar Na⁺/H⁺ exchange activity in Salicornia bigelovii Torr. in response to NaCl.
- L10 ANSWER 5 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
TI Relationship between **tonoplast** H⁺-ATPase activity, ion uptake and calcium in barley roots under NaCl stress
- L10 ANSWER 6 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 5
TI Effect of K⁺ nutrition on growth and activity of leaf **tonoplast** V-H⁺-ATPase and V-H⁺-**PPase** of Suaeda salsa under NaCl stress
- L10 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
TI Stress-**resistant** oversized transgenic **plants** capable of growing in salinized soil
- L10 ANSWER 8 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 6
TI **Drought-** and **salt-tolerant plants** result from overexpression of the AVP1 H⁺-pump.
- L10 ANSWER 9 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 7
TI Effects of **salt** treatment and osmotic stress on V-ATPase and V-**PPase** in leaves of the halophyte Suaeda salsa.
- L10 ANSWER 10 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 8
TI Isolation and characterization of a Na⁺/H⁺ antiporter gene from the halophyte Atriplex gmelini.

=> d ab

L10 ANSWER 1 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

AB Two cDNA clones encoding vacuolar H⁺-inorg. **pyrophosphatase** (HVP1 and HVP10), one clone encoding the catalytic subunit (68 kDa) of vacuolar H⁺-ATPase (HvVHA-A), and one clone encoding vacuolar Na⁺/H⁺ antiporter (HvNHX1) were isolated from barley (*Hordeum vulgare*), a **salt-tolerant** crop. **Salt** stress increased the transcript levels of HVP1, HVP10, HvVHA-A, and HvNHX1, and osmotic stress also increased the transcript levels of HVP1 and HvNHX1 in barley roots. The transcription of HVP1 in response to **salt** stress was regulated differently from that of HVP10. In addition, the HVP1 expression changed in a pattern similar to that of HvNHX1 expression. These results indicate that the expression of HVP1 is coordinated with that of HvNHX1 in barley roots in response to **salt** and osmotic stresses.

=> d so

L10 ANSWER 1 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
SO Journal of Experimental Botany (2004), 55(397), 585-594
CODEN: JEBOA6; ISSN: 0022-0957

=> d 2 ab

L10 ANSWER 2 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
AB A review. Evidence indicates that **plant salt tolerance** operates at a cellular level. Commonly proposed cellular mechanisms include ion sequestration in vacuoles or ion exclusion at plasma membranes. Plasma membrane ATPase and vacuolar ATPase and **pyrophosphatase** are proton pumps that provide an energy source for transport of ions across the plasma membrane and **tonoplast**, resp. Membrane Na⁺/H⁺ antiporters take advantage of the proton gradient formed by these pumps to exchange Na⁺ for H⁺ across a membrane. Therefore, activity and expression of these proton pumps and Na⁺/H⁺ antiporters are investigated in numerous **plant** species under saline environment. In this review, information is presented on responses of **tonoplast** and plasma membrane ATPases and Na⁺/H⁺ antiporters to salinity. Inconsistencies exist in some of the information and this may be due to differences in cultivars, exptl. conditions, **salt** level used and **plant** age. Correlation between increased activity and expression of these transport proteins and adaptation to salinity is proposed, although this correlation is based on untested hypotheses. This precludes a general conclusion to be drawn concerning the involvement of membrane transport systems in **plant salt tolerance**. It is obvious that further extensive studies are needed in this area.

=> d 2 so

L10 ANSWER 2 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
SO Plant Science (Shannon, Ireland) (2003), 164(6), 891-900
CODEN: PLSCE4; ISSN: 0168-9452

=> d 5 ab

L10 ANSWER 5 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
AB The relationship between **tonoplast** H⁺-ATPase activity, ion uptake, and Ca in barley roots under NaCl stress was studied. Under NaCl stress for 2 d, H⁺-ATPase activity was increased, and H⁺-**PPase** activity was decreased in the **tonoplast** of **salt-tolerant** barley (*Hordeum vulgare* L. cv. "Tanyin 2") roots. La3⁺ (1 mmol/L), an inhibitor of Ca²⁺ channel in plasma membrane, and EGTA (5 mmol/L), a Ca²⁺ chelator, inhibited this NaCl-induced increase in

H⁺-ATPase activity but stimulated the H⁺-PPase activity.
 Treatment of barley roots with CaM antagonist also diminished the increase of H⁺-ATPase activity induced by NaCl. La³⁺, TFP, or La³⁺ + TFP increased Na⁺ uptake and decreased K⁺ and Ca²⁺ uptake in barley roots under NaCl stress. These results suggested that the activation of **tonoplast** H⁺-ATPase and the regulation of Na⁺ and K⁺ uptake under NaCl stress may be related to Ca²⁺-CaM system.

=> d 5 so

L10 ANSWER 5 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 4
 SO Acta Botanica Sinica (2002), 44(6), 667-672
 CODEN: ABSCG9; ISSN: 1672-6650

=> d 7 ab

L10 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
 AB A stress **resistant**, oversized, transgenic **plant** capable of growing in salinized media comprising a polynucleotide sequence causing upregulated express of vacuolar **pyrophosphatase**. Further disclosed, is the **seed** produced by such transgenic **plants** which comprises such polynucleotide sequence, and progeny **plants** grown from such **seed**. Thus, tomato **plants**, transformed with the genes AVP-1 which encodes for an inorg. **pyrophosphatase** and NHX-1 which encodes for a sodium transporter, demonstrated higher intracellular cation concns. when grown in saline soils.

=> d 7 so

L10 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
 SO PCT Int. Appl., 68 pp.
 CODEN: PIXXD2

=> d 7 pi

L10 ANSWER 7 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001033945	A1	20010517	WO 2000-US30955	20001110
WO 2001033945	C1	20020725		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
CA 2390719	AA	20010517	CA 2000-2390719	20001110
BR 2000015636	A	20020709	BR 2000-15636	20001110
EP 1231831	A1	20020821	EP 2000-980337	20001110
R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR			
JP 2003516727	T2	20030520	JP 2001-535966	20001110
NZ 519362	A	20040528	NZ 2000-519362	20001110
CA 2418127	AA	20020228	CA 2001-2418127	20010324
WO 2002015674	A1	20020228	WO 2001-US9548	20010324
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,			

CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR,
 HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT,
 LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU,
 SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN,
 YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
 DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,
 BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

AU 2001050974 A5 20020304 AU 2001-50974 20010324
 EP 1315410 A1 20030604 EP 2001-924311 20010324
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

BR 2001013466 A 20040217 BR 2001-13466 20010324
 US 2002178464 A1 20021128 US 2001-834998 20010413
 US 2002023282 A1 20020221 US 2001-934088 20010820
 CA 2419901 AA 20020228 CA 2001-2419901 20010820
 WO 2002016558 A1 20020228 WO 2001-US41806 20010820

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,
 CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT,
 RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US,
 UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY,
 DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF,
 BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

AU 2001085459 A5 20020304 AU 2001-85459 20010820
 EP 1315795 A1 20030604 EP 2001-964622 20010820
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR

BR 2001013467 A 20040406 BR 2001-13467 20010820

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(2004) on STN

DUPLICATE 7

AB The Chenopodiaceae *Suaeda salsa* L. was grown under different salt
 concentrations and under osmotic stress. The fresh weight was markedly
 stimulated by 0.1 M NaCl, 0.4 M NaCl and 0.1 M KCl and reduced by osmotic
 stress (PEG iso-osmotic to 0.1 M NaCl). Treatment with 0.4 M KCl severely
 damaged the plants. Membrane vesicle fractions containing
tonoplast vesicles were isolated by sucrose gradient from leaves
 of the *S. salsa* plants and modulations of V-ATPase and V-
PPase depending on the growth conditions were determined. Western
 blot analysis revealed that V-ATPase of *S. salsa* consists of at least nine
 subunits (apparent molecular masses 66, 55, 52, 48, 36, 35, 29, 18, and 16
 kDa). This polypeptide pattern did not depend on culture conditions. V-
PPase is composed of a single polypeptide (69 kDa). An additional
 polypeptide (54 kDa) was detected in the fractions of NaCl-, KCl- and
 PEG-treated plants. It turned out that the main strategy of
salt-tolerance of *S. salsa* seems to be an up-regulation
 of V-ATPase activity, which is required to energize the **tonoplast**
 for ion uptake into the **vacuole**, while V-**PPase** plays
 only a minor role. The increase in V-ATPase activity is not obtained by
 structural changes of the enzyme, but by an increase in V-ATPase protein
 amount.

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(2004) on STN

DUPLICATE 7

- SO Journal of experimental botany, Dec 2001. Vol. 52, No. 365. p. 2355-2365
Publisher: Oxford : Oxford University Press.
CODEN: JEBOA6; ISSN: 0022-0957

=> d 11-20 ti

- L10 ANSWER 11 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
TI Effects of NaCl stress on the **tonoplast** ATPase and **PPase** activity in roots, sheaths and blades of sorghum seedlings
- L10 ANSWER 12 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2004) on STN
TI The Arabidopsis thaliana proton transporters, AtNhx1 and Avp1, can function in cation detoxification in yeast.
- L10 ANSWER 13 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 9
TI Effect of NaCl, glutathione and ascorbic acid on function of **tonoplast** vesicles isolated from barley leaves
- L10 ANSWER 14 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 10
TI Effects of fatty acids on lipid composition and function of **tonoplast** vesicles in barley seedlings under **salt** stress
- L10 ANSWER 15 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 11
TI Effects of NaCl stress on H⁺-ATPase and H⁺-**PPase** activities of **tonoplast**-enriched vesicles isolated from the roots of **salt-tolerant** mutant of wheat and its wild type
- L10 ANSWER 16 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 12
TI Na⁺/H⁺ antiporter in **tonoplast** vesicles from rice roots
- L10 ANSWER 17 OF 29 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
TI Vacuolar sodium accumulation in Salicornia bigelovii Torr.
- L10 ANSWER 18 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
TI The role of sugar accumulation in leaf frost hardiness - investigations with transgenic tobacco expressing a bacterial **pyrophosphatase** or a yeast invertase gene
- L10 ANSWER 19 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 13
TI Plasma membrane isolation from freshwater and **salt-tolerant** species of Chara: antibody cross-reactions and phosphohydrolase activities.
- L10 ANSWER 20 OF 29 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
TI **Salt** stress responses of higher **plants**: The role of proton pumps and Na⁺/H⁺-antiporters.

=> d 11 ab

- L10 ANSWER 11 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
AB During the early period of NaCl stress, Na⁺ accumulated mainly in roots

and sheaths (Table 1). Correspondingly, the **tonoplast** ATPase and **PPase** hydrolysis activity (Fig. 1), ATP- and PPI-dependent proton pump activity and Na⁺/H⁺ antiport activity in roots and sheaths increased significantly (Figs. 2, 3), but root and sheath growth was not inhibited (Table 1). During the later period of NaCl stress, Na⁺ began to be transported to the shoots and accumulated in the blades (Table 1). At this time, proton pump activity and Na⁺/H⁺ antiport activity in the blades also began to increase (Figs. 2, 3), ratio of Na/K of the roots and sheaths increased (Table 1) and their **tonoplast** ATPase and **PPase** hydrolysis activity (Fig. 1), **tonoplast** proton pump activity and Na⁺/H⁺ antiport activity decreased (Figs. 2, 3). Correspondingly, root and sheath growth was reduced (Table 1). ATPase and **PPase** activities of the **tonoplast** vesicles decreased as the Na/K ratio in the reaction medium rose to higher than 1 (Figs. 4, 5). These results indicated that the **tonoplast** proton pump activity of nonhalophyte plays an important role in Na⁺ accumulation in vacuoles and **salt tolerance** during the early period of **salt** stress.

=> d 11 so

L10 ANSWER 11 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN
 SO Zhiwu Shengli Xuebao (2000), 26(3), 181-188
 CODEN: CWSPDA; ISSN: 0257-4829

=> d 12 ab

L10 ANSWER 12 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
 AB Overexpression of the Arabidopsis thaliana vacuolar H⁺-**pyrophosphatase** (AVP1) confers **salt tolerance** to the **salt**-sensitive enal mutant of Saccharomyces cerevisiae. Suppression of **salt** sensitivity requires two ion transporters, the Gef1 Cl⁻ channel and the Nhx1 Na⁺/H⁺ exchanger. These two proteins colocalize to the prevacuolar compartment of yeast and are thought to be required for optimal acidification of this compartment. Overexpression of AtNHX1, the **plant** homologue of the yeast Na⁺/H⁺ exchanger, suppresses some of the mutant phenotypes of the yeast nhx1 mutant. Moreover, the level of AtNHX1 mRNA in Arabidopsis is increased in the presence of NaCl. The regulation of AtNHX1 by NaCl and the ability of the **plant** gene to suppress the yeast nhx1 mutant suggest that the mechanism by which cations are detoxified in yeast and **plants** may be similar.

=> d 12 so

L10 ANSWER 12 OF 29 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN
 SO Proceedings of the National Academy of Sciences of the United States of America, Feb 16, 1999. Vol. 96, No. 4. p. 1480-1485
 Publisher: Washington, D.C. : National Academy of Sciences,
 CODEN: PNASA6; ISSN: 0027-8424

=> d 20 ab

L10 ANSWER 20 OF 29 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on

STN

AB In **salt**-stressed higher **plants** NaCl may either be excluded from the cells or sequestered into the **vacuole**. Different pathways may dominate in different **plants** and different organs of the same **plant**. The proteins involved in **salt** transport across the plasma membrane and the **tonoplast** i.e. proton pumps and Na⁺/H⁺-antiporters have been identified. Progress in cloning of the P-type H⁺-ATPase, the V-type H⁺-ATPase, and the vacuolar H⁺-PP-iase has provided important tools for the study of the molecular mechanisms involved in ion sequestration. However, not a single **plant** has as yet been studied in sufficient detail to allow a comprehensive evaluation of the relative importance of individual transport processes for the **salt tolerance** of an intact **plant**. This review summarizes our present as yet limited knowledge and identifies promising areas for future research.

=> d 20 so

L10 ANSWER 20 OF 29 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
STN
S0 Journal of Plant Physiology, (1996) Vol. 148, No. 3-4, pp. 425-433.
CODEN: JPPHEY. ISSN: 0176-1617.

=> d 21-29 ti

L10 ANSWER 21 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 14

TI Effects of **salt** stress on H⁺-ATPase and H⁺-PPase
activities of **tonoplast**-enriched vesicles isolated from
sunflower roots

L10 ANSWER 22 OF 29 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
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(2004) on STN DUPLICATE 15

TI Vacuolar H(+)-translocating **pyrophosphatase** is induced by anoxia
or chilling in seedlings of rice.

L10 ANSWER 23 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

TI Quantitative stress responses of the V0V1-ATPase of higher **plants**
detected by immuno-electron microscopy

L10 ANSWER 24 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 16

TI Enhanced K⁺-stimulated **pyrophosphatase** activity in NaCl-adapted
cells of *Acer pseudoplatanus*

L10 ANSWER 25 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 17

TI Enhanced activity of **tonoplast pyrophosphatase** in
sodium chloride grown cells of *Daucus carota*

L10 ANSWER 26 OF 29 CAPLUS COPYRIGHT 2004 ACS on STN

TI Lateral and rotational mobilities of lipids in specific cellular membranes
of *Eucalyptus gunnii* cultivars exhibiting different **freezing**
tolerance

L10 ANSWER 27 OF 29 AGRICOLA Compiled and distributed by the National
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(2004) on STN

TI Molecular markers for ion compartmentation in cells of higher
plants. I. Isolation of vacuoles of high purity.

L10 ANSWER 28 OF 29 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on

STN

TI MOLECULAR MARKERS FOR ION COMPARTMENTATION IN CELLS OF HIGHER
PLANTS 1. ISOLATION OF VACUOLES OF HIGH PURITY.

L10 ANSWER 29 OF 29 AGRICOLA Compiled and distributed by the National
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of America. It contains copyrighted materials. All rights reserved.
(2004) on STN

TI Protective effect of exogenous polyamines on root **tonoplast**
function against **salt** stress in barley seedlings.

=> s ((gaxiola, r?) or (gaxiola r?))/au
L11 49 ((GAXIOLA, R?) OR (GAXIOLA R?))/AU

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PROCESSING COMPLETED FOR L11
L12 24 DUP REM L11 (25 DUPLICATES REMOVED)

=> d 1-10 ti

L12 ANSWER 1 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN
TI Genetic engineering cotton for higher drought- and salt-tolerance

L12 ANSWER 2 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 1
TI Yeast hygromycin sensitivity as a functional assay of cyclic nucleotide
gated cation channels

L12 ANSWER 3 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN
TI Salt Stress Proteins Identified by a Functional Approach in Yeast

L12 ANSWER 4 OF 24 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
STN
TI Frequency of PvuII (LPL) genetic polymorphism in patients with Arterial
Coronary Disease from Mexican population.

L12 ANSWER 5 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 2
TI GSTT1 gene deletion is associated with lung cancer in Mexican patients

L12 ANSWER 6 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN
TI Functional genomics of salt tolerance: The yeast overexpression approach

L12 ANSWER 7 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN
TI Enhanced meristematic activity and competence by overexpression of
tonoplast pyrophosphatase

L12 ANSWER 8 OF 24 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 3
TI Genetic manipulation of vacuolar proton pumps and transporters.

L12 ANSWER 9 OF 24 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on
STN
TI Over-expression of the vacuolar H⁺-pump AVP1 positively affects growth and
development in Arabidopsis.

L12 ANSWER 10 OF 24 AGRICOLA Compiled and distributed by the National
Agricultural Library of the Department of Agriculture of the United States
of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 4
TI Drought- and salt-tolerant plants result from overexpression of the AVP1
H⁺-pump.

=> d ab

L12 ANSWER 1 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN

AB Drought and salinity are two major limiting factors in crop productivity. The drought-caused crop loss was over \$1 billion annually in Texas, of which about half resulted from cotton loss. Besides drought, saline water and soils also contribute to the reduction in cotton yield and fiber quality in America's Southwest. One way to reduce cotton loss caused by drought and salinity is to increase solute concentration in the vacuoles of cotton cells,

so that the solute potential is more neg. inside cells, resulting in water to move into cells and avoiding accumulation of sodium ion to toxic level in cytoplasm, therefore better water retention and higher salt tolerance can be achieved. The success of this approach was demonstrated in various plants by overexpressing the Arabidopsis genes AtNHX1 that encodes a sodium/proton antiporter and AVP1 that encodes a proton pump. Overexpression of AtNHX1 increases vacuolar uptake of sodium, whereas overexpression of AVP1 generates higher proton electrochem. gradient (PEG) across the vacuolar membrane that energizes secondary transporters including AtNHX1, both of which lead to increased vacuolar solute concentration and therefore higher salt- and drought-tolerance in transgenic plants. In an effort to engineer cotton for higher drought- and salt-tolerance, transgenic cotton plants that express AtNHX1 were created. Since AtNHX1 activity depends on PEG generated by proton pumps like AVP1, a coupled overexpression of AtNHX1 and AVP1 would potentially confer higher tolerance against drought and salt in transgenic plants. Therefore creating another transgenic cotton line that expresses the Arabidopsis AVP1 gene is also underway. It is hoped that AtNHX1- and AVP1-double overexpression cotton will be more drought- and salt-tolerant.

=> d so

L12 ANSWER 1 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN

SO Proceedings - Beltwide Cotton Conferences (2004) 1149-1152
CODEN: PCOCEN; ISSN: 1059-2644

=> d 3 ab

L12 ANSWER 3 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN

AB A review. We have performed functional genomics of salt stress by overexpression of gene libraries in yeast and selection for salt tolerance. Thirty halotolerance genes were isolated from yeast, Arabidopsis, and sugar beet. The results indicate that Na⁺ transport (uptake, efflux, and compartmentation), sulfate activation, RNA processing, and protein synthesis are crucial for salt tolerance.

=> d 3 so

L12 ANSWER 3 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN

SO Monatshefte fuer Chemie (2003), 134(11), 1445-1464
CODEN: MOCMB7; ISSN: 0026-9247

=> d 8 ab

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(2004) on STN

DUPLICATE 3

=> d 8 so

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(2004) on STN DUPLICATE 3
- SO Plant physiology, July 2002. Vol. 129, No. 3. p. 967-973
Publisher: Rockville, MD : American Society of Plant Physiologists, 1926-
CODEN: PLPHAY; ISSN: 0032-0889

=> d 10 ab

- L12 ANSWER 10 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 4
- AB Transgenic plants overexpressing the vacuolar H(+)-pyrophosphatase are much more resistant to high concentrations of NaCl and to water deprivation than the isogenic wild-type strains. These transgenic plants accumulate more Na(+) and K(+) in their leaf tissue than the wild type. Moreover, direct measurements on isolated vacuolar membrane vesicles derived from the AVP1 transgenic plants and from wild type demonstrate that the vesicles from the transgenic plants have enhanced cation uptake. The phenotypes of the AVP1 transgenic plants suggest that increasing the vacuolar proton gradient results in increased solute accumulation and water retention. Presumably, sequestration of cations in the vacuole reduces their toxic effects. Genetically engineered drought- and salt-tolerant plants could provide an avenue to the reclamation of farmlands lost to agriculture because of salinity and a lack of rainfall.

=> d 11-20 ti

- L12 ANSWER 11 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 5
- TI Arabidopsis ALF5, a multidrug efflux transporter gene family member, confers resistance to toxins.
- L12 ANSWER 12 OF 24 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
- TI Increased size, salt and drought tolerance in *A. thaliana* overexpressing AVP1 vacuolar H⁺- pyrophosphatase.
- L12 ANSWER 13 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Root-specific protein EIR1 involved in auxin transport, Arabidopsis and rice cDNA and genomic sequences, and uses
- L12 ANSWER 14 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 6
- TI The Arabidopsis *thaliana* proton transporters, AtNhxl and Avp1, can function in cation detoxification in yeast.
- L12 ANSWER 15 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved.
(2004) on STN DUPLICATE 7
- TI A *Selaginella lepidophylla* trehalose-6-phosphate synthase complements growth and stress-tolerance defects in a yeast *tps1* mutant.

- L12 ANSWER 16 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 8
- TI The yeast CLC chloride channel functions in cation homeostasis.
- L12 ANSWER 17 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN DUPLICATE 9
- TI EIR1, a root-specific protein involved in auxin transport, is required for gravitropism in *Arabidopsis thaliana*
- L12 ANSWER 18 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 10
- TI A halotolerant mutant of *Saccharomyces cerevisiae*.
- L12 ANSWER 19 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 11
- TI Construction of a CUP1 promoter-based vector to modulate gene expression of *Saccharomyces cerevisiae*.
- L12 ANSWER 20 OF 24 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Crucial reactions for salt tolerance in yeast

=> d 12 ab

- L12 ANSWER 12 OF 24 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN

=> d 12 so

- L12 ANSWER 12 OF 24 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
- SO Plant Biology (Rockville), (2001) Vol. 2001, pp. 85. print.
Meeting Info.: Joint Annual Meetings of the American Society of Plant Biologists and the Canadian Society of Plant Physiologists. Providence, Rhode Island, USA. July 21-25, 2001. American Society of Plant Biologists; Canadian Society of Plant Physiologists.

=> d 14 ab

- L12 ANSWER 14 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 6
- AB Overexpression of the *Arabidopsis thaliana* vacuolar H⁺-pyrophosphatase (AVP1) confers salt tolerance to the salt-sensitive enal mutant of *Saccharomyces cerevisiae*. Suppression of salt sensitivity requires two ion transporters, the Gef1 Cl⁻ channel and the Nhx1 Na⁺/H⁺ exchanger. These two proteins colocalize to the prevacuolar compartment of yeast and are thought to be required for optimal acidification of this compartment. Overexpression of AtNHX1, the plant homologue of the yeast Na⁺/H⁺ exchanger, suppresses some of the mutant phenotypes of the yeast nhx1 mutant. Moreover, the level of AtNHX1 mRNA in *Arabidopsis* is increased in the presence of NaCl. The regulation of AtNHX1 by NaCl and the ability of the plant gene to suppress the yeast nhx1 mutant suggest that the mechanism by which cations are detoxified in yeast and plants may be similar.

=> d 14 so

- L12 ANSWER 14 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 6
- SO Proceedings of the National Academy of Sciences of the United States of America, Feb 16, 1999. Vol. 96, No. 4. p. 1480-1485
Publisher: Washington, D.C. : National Academy of Sciences,
CODEN: PNASA6; ISSN: 0027-8424

=> d 21-24 ti

- L12 ANSWER 21 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 12
- TI Microbial models and salt stress tolerance in plants.
- L12 ANSWER 22 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 13
- TI Salt tolerance and methionine biosynthesis in *Saccharomyces cerevisiae* involve a putative phosphatase gene.
- L12 ANSWER 23 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 14
- TI A novel and conserved salt-induced protein is an important determinant of salt tolerance in yeast.
- L12 ANSWER 24 OF 24 BIOSIS COPYRIGHT (c) 2004 The Thomson Corporation. on STN
- TI A SODIUM CHLORIDE REGULATED GENE INVOLVED IN SODIUM CHLORIDE TOLERANCE.

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=> d 21 so

- L12 ANSWER 21 OF 24 AGRICOLA Compiled and distributed by the National Agricultural Library of the Department of Agriculture of the United States of America. It contains copyrighted materials. All rights reserved. (2004) on STN DUPLICATE 12
- SO Critical reviews in plant sciences, 1994. Vol. 13, No. 2. p. 121-138
Publisher: Boca Raton, Fla. : CRC Press, [c1983-
CODEN: CRPSD3; ISSN: 0735-2689